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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/661,322	09/12/2003	Laxmi Priya Parida	YOR920030299US1	9308
7590 Ryan, Mason & Lewis, LLP Suite 205 1300 Post Road Fairfield, CT 06430			EXAMINER COUGHLAN, PETER D	
			ART UNIT 2129	PAPER NUMBER
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/661,322

Applicant(s)

PARIDA ET AL.

Examiner

Peter Coughlan

Art Unit

2129

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 October 2007.
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-35 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 1-35 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☒ The drawing(s) filed on 12 September 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Detailed Action

1. This office action is in response to an AMENDMENT entered October 3, 2007 for the patent application 10/661322 filed on September 12, 2003.
2. All previous Office Actions are fully incorporated into this Non-Final Office Action by reference.

Status of Claims

3. Claims 1-35 are pending.

Specification Objection

4. The amendment filed 10/03/2007 is objected to under 35 U.S.C. 132(a) because it introduces new matter into the disclosure. 35 U.S.C. 132(a) states that no amendment shall introduce new matter into the disclosure of the invention. The added material which is not supported by the original disclosure is as follows: The original specification pertains only to discovering permutation patterns with a domain of being an 'abstract problem.' By crossing out 'abstract' the applicant is introducing problems that are both 'abstract' and other domains

as well. (page 3:16-26) On page 2:4 through page 3:14 describes applications which are not based in 'abstract problem' solving domain which was presented in the original specification.

Applicant is required to cancel the new matter in the reply to this Office Action.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 31, 33, 35 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. These claims state that relationship is functional. This is not described within the specification. There is no definition of 'functional relationship.' In fact, using the excepted definition of a function, the relationship is not functional.

For example the lets assign the following permutation patterns a set of labels.

Pattern	Label
2, 1	2
1, 1	3
1, 2	4
2, 3	5
4, 3	6
3, 2	7
3, 4	8

Then the following permutation patterns will be relabeled.

Pattern	Label
2, 1, 1, 1	5
1, 2, 1, 1	6
1, 1, 2, 1	7
1, 1, 1, 2	8

So what is the practical application in relabeling the permutation of 1, 2, 1, 1 into 6? Considering the permutation pattern already has a label of 1, 2, 1, 1.

Let's add the following assignment of permutation patterns and label set

Pattern	Label
0, 0	9
9, 9	10
6, 10	11

This result with the following permutation pattern of 1, 2, 1, 1, 0, 0, 0, 0 is labeled as 11.

Summarizing

Pattern	Label
1, 2, 1, 1	6
1, 2, 1, 1, 0, 0, 0, 0	11

Thus with 1 'a' component, 2 'b' components, 1 'c' component and 1 'd' component as a permutation pattern results in 2 different labels and thus is not functional.

These claims must be amended or withdrawn from consideration.

Claims 30, 32, 34 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. These claims state that the 'relationship is 'structural.' 'The word 'structural' is not mentioned within the specification and is not a common term within the art. The Examiner has no idea what is meant by 'structural.'

These claims must be amended or withdrawn from consideration.

35 USC § 101

6. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 1-35 are rejected under 35 U.S.C. 101 for nonstatutory subject matter.

The computer system must set forth a practical application of that § 101 judicial

exception to produce a real-world result. Benson, 409 U.S. at 71-72, 175 USPQ at 676-77. The invention is ineligible because it has not been limited to a substantial practical application. The application is an algorithm that searches for patterns along a one-dimensional array. There has to be an application for this method to be employed with to have a useful purpose. Additionally, the claims describe preemption. The statement 'providing said permutation patterns for utilization in said application that processes said relationship between said groups of said characters identified by said permutation patterns' describe no specific application. This statement describes the use of the invention can be used for any application that processes a relationship between groups of characters. 'Utilization in an application' means 'utilization' in any application' thus disclosing preemption. 'Characters' are not limited to a specific application thus disclosing preemption.

In determining whether the claim is for a "practical application," the focus is not on whether the steps taken to achieve a particular result are useful, tangible and concrete, but rather that the final result achieved by the claimed invention is "useful, tangible and concrete." If the claim is directed to a practical application of the § 101 judicial exception producing a result tied to the physical world that does not preempt the judicial exception, then the claim meets the statutory requirement of 35 U.S.C. § 101.

The application describes open ended uses which is equivalent to preemption. There must be one invention per application.

Finding patterns in strings at an academic level is not clear in its purpose or scope. There has to be a reason for finding such strings and their usefulness in a real world application, is questioned. The application as it stands is strictly an academic exercise with no useful and tangible function and/or result.

The invention must be for a practical application and either:

- 1) specify transforming (physical thing) or
- 2) have the FINAL RESULT (not the steps) achieve or produce a
useful (specific, substantial, AND credible),
concrete (substantially repeatable/ non-unpredictable), AND
tangible (real world/ non-abstract) result.

Claims that recite an algorithm with given parameters with no reason why and no stated use are not statutory.

Claims that recite preemption must be amended to limit the practical application to a single purpose or function.

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-17, 20-26, 29, 30-35 are rejected under 35 U.S.C. 102(b)

(hereinafter referred to as **Floratos**) being anticipated by Floratos, 'DELPHI: A pattern-based method for detecting sequence similarity'.

Claim 1.

Floratos anticipates selecting a new portion of the input string, the new portion differing from a previously selected portion of the input string by at least one new character of the input string (**Floratos**, p457 C1:26 through C2:4; 'Window size' of applicant is equivalent to 'W' of Floratos. When in search mode, the method searches strings of width W. Since a string is being searched this is done by inputting a new portion of the string on one end of the width and removing an old portion at the other end of the width, similar to a window of size 'W' moving down a one-dimensional array.); determining one or more values for how many of the at least one new character are in the portion of the input string (**Floratos**, p457 C1:26 through C2:4; 'Determining one or more values' of applicant is equivalent to 'L' of Floratos. Where 'L' is the number of matches in a pattern query 'Q'); determining which, if any, names in a plurality of sets of names have changed by selection of the new portion, the plurality of sets comprising a first set and a plurality of additional sets, wherein the first set corresponds to all of the characters in the alphabet and to values of how many of

the characters of the alphabet are in the previously selected portion, wherein the values are names for the first set, and wherein each additional set comprises names corresponding to selected pairs of names from a single other set (**Floratos**, p457 C2:5-15; 'First set' of applicant is equivalent to 'query sequence (Q)' of Floratos. 'Additional sets' of applicant is equivalent to matches of 'Q' 'Single other set' of applicant is equivalent to 'D' of Floratos.); and using changes in the names to determine the permutation patterns. (**Floratos**, p457 C1:26-43; Each 'permutation patterns' of applicant is disclosed by the algorithm which produces as output the complete set of all of the maximal (L, W) patterns that appear in at least K of the sequences in the set D of Floratos.) and providing said permutation patterns for utilization in said application that process said relationship between said groups of said characters identified by said permutation patterns. (**Floratos**, abstract; 'Utilization' of applicant is illustrated by the 'discovery [of] weak but biologically important similarities' of Floratos.)

Claims 2 and 21.

Floratos anticipates the at least one processor (**Floratos**, p471, C1:6-32) is further configured, in order to determine the plurality of levels (**Floratos**, p457, C1:26-43; 'Plurality of levels' determination is preformed by 'level of our pattern discovery algorithm' of Floratos.): to determine the first set by determining values of how many of each of the characters of the alphabet are in the previously

selected portion (**Floratos**, C457, C1:26-43; 'How many of each characters' of applicant is equivalent to 'density' of **Floratos**.); and to determine the additional sets by assigning names for a given additional set to selected pairs of names from another of the sets, wherein each assigned name is unique to the names for a selected pair. (**Floratos**, p456 C2:44 through p457 C1:7; 'Assigning names' of applicant is equivalent to 'offset list' of **Floratos**.)

Claim 3.

Floratos anticipates wherein the assigned names are codes. (**Floratos**, p456, C2:20-38; In this example the code is ("A.CH..E"))

Claim 4.

Floratos anticipates wherein the codes are natural numbers. (**Floratos**, p457, C1:17-25; **Floratos** illustrates the 'backbone' which indicates the importance of location among the query pattern. For example the 'backbone' of the sample in claim 3 would be "1011001".)

Claims 5 and 22.

Floratos anticipates wherein the at least one processor (**Floratos**, p471, C1:6-32) is further configured, when determining which, if any, names in a plurality of sets of names have changed determines that a name has changed to determine that a new name is needed for the changed name. (**Floratos**, p457 C2:44 through p458 C2:15; 'Set of names' of applicant is equivalent to ' π ' (or set

of <L, W> patterns). The process of 'determining' of applicant is equivalent to 'pattern matching' of Floratos.)

Claim 6.

Floratos anticipates wherein the step of determining which, if any, names in a plurality of sets of names have changed further comprises the step of selecting a new name, not currently in use in the sets of names, for the changed name. (**Floratos**, p458 C1:5 through C2:15 and Figure 1; This pertains to the generation of hash values for every substring. 'New name' of applicant is equivalent to 'hash value' of Floratos.)

Claims 7 and 23.

Floratos anticipates wherein the at least one processor (**Floratos**, p471, C1:6-32) is further configured to determine, for a name that has changed in the sets of names, a location in the input string that corresponds to the changed name. (**Floratos**, p458 C1:5 through C2:32 and Figure 2; A hash table will 'point' to a particular list of offsets of a substring.)

Claim 8.

Floratos anticipates wherein the changed name corresponds to at least two characters of the input string and a location in the input string of a given character of the at least two characters is chosen as the determined location. (**Floratos**, Figures 1 and 2; The generation of hash values is based at least two

characters and using the hash values to generate a hash table which 'points' to the beginning of a substring.)

Claims 9 and 24.

Floratos anticipates wherein each of the names in the sets of names corresponds to a pattern, and wherein the at least one processor (**Floratos**, p471, C1:6-32) is further configured, when using changes in the names, to select permutation patterns from the patterns. (**Floratos**, p458 C2:16-32; 'Select permutation patterns' of applicant is equivalent to finding two residues of a substring.)

Claim 10.

Floratos anticipates the step of comparing names that have changed in the sets of names to a database comprising a plurality of stored names. (**Floratos**, p458 C2:46 through p459 C1:4; Floratos illustrates comparing two names that share the same location.)

Claims 11 and 25.

Floratos anticipates wherein the additional sets have names corresponding to only a single pair of names from another set. (**Floratos**, p459, C1:5-22; The 'pair of names' of applicant are 'chained' by Floratos resulting in 'additional sets' of applicant.)

Claims 12 and 26.

Floratos anticipates wherein the at least one processor (**Floratos**, p471, C1:6-32) is further configured, when using changes in the names to determine permutation patterns, to correlate the changed names with permutation patterns. (**Floratos**, p457 C2:44 through p458 C2:32; 'Determine permutation patterns' and 'correlate' of applicant is equivalent to 'searching' and 'pattern matching' of Floratos.)

Claim 13.

Floratos anticipates wherein the step of determining which, if any, names in a plurality of sets of names further comprises, for each changed name, updating a count corresponding to that changed name (**Floratos**, p458 C2:16-32; 'Updating count' of applicant is equivalent to 'increment by one' of Floratos.), and wherein the method further comprises the step of: performing the steps of selecting, determining one or more values, and determining which, if any, names in a plurality of sets of names until the entire input string has been selected. (**Floratos**, p458 C2:16-32; 'Until the entire input string' of applicant is equivalent to when the counter C, is $C[i] \text{ equals } (n-1)$ of Floratos.)

Claim 14.

Floratos anticipates wherein portions selected have a predetermined size, and wherein the method further comprises the step of selecting a number of

predetermined sizes and performing the steps of selecting, determining one or more values, and determining which, if any, names in a plurality of sets of names for each of the predetermined sizes. (**Floratos**, p459 C2:18 through p460 C1:7; 'Determining one of more values' of applicant is equivalent to 'L, W and K_{\min} ' of Floratos.)

Claim 15.

Floratos anticipates wherein the step of using changes further comprises the step of determining permutation patterns corresponding to counts greater than or equal to a predetermined count. (**Floratos**, p462 C2:5 through p463 C1:17; Here Floratos illustrates an example of permutation patterns where $k_{\min} = 15$ and only patterns with support of 15 or higher are counted.)

Claim 16.

Floratos anticipates the step of determining maximal permutation patterns from the determined permutation patterns. (**Floratos**, p457 C1:8-14)

Claim 17.

Floratos anticipates the step of determining which, if any, names in a plurality of sets of names further comprises the step of determining location lists for each of the names corresponding to permutation patterns (**Floratos**, p458 C1:5 through C2:32 and Figure 2; 'Location lists' of applicant is equivalent to 'hash table' of Floratos.), and wherein the step of determining maximal

permutation patterns further comprises the steps of comparing location lists for permutation patterns and eliminating duplicate permutation patterns by using the location lists. (**Floratos**, p458 C2:33 through p459 C1:22; 'Eliminating duplicate permutation patterns' of applicant is accomplished by 'chaining' of Floratos.)

Claim 20.

Floratos anticipates a memory (**Floratos**, p471, C1:6-32) ; at least one processor coupled to the memory, the at least one processor configured: to select a new portion of the input string, the new portion differing from a previously selected portion of the input string by at least one new character of the input string (**Floratos**, p457 C1:26 through C2:4; 'Window size' of applicant is equivalent to 'W' of Floratos. When in search mode the method searches at strings of width W. Since a string is being searched this is done by inputting a new portion of the string on one end of the width and removing an old portion at the other end of the width. Must like a window of size 'W' moving down a one-dimensional array.); to determine one or more values for how many of the at least one new character are in the portion of the input string (**Floratos**, p457 C1:26 through C2:4; 'Determining one or more values' of applicant is equivalent to 'L' of Floratos. Where 'L' is the number of matches in a pattern query 'Q'); determine which, if any, names in a plurality of sets of names have changed by selection of the new portion, the plurality of sets comprising a first set and a plurality of additional sets, wherein the first set corresponds to all of the characters in the alphabet and to values of how many of the characters of the

alphabet are in the previously selected portion, wherein the values are names for the first set, and wherein each additional set comprises names corresponding to selected pairs of names from a single other set (**Floratos**, p457 C2:5-15; 'First set' of applicant is equivalent to 'query sequence (Q)' of **Floratos**. 'Additional sets' of applicant is equivalent to matches of 'Q' 'Single other set' of applicant is equivalent to 'D' of **Floratos**.); and to use changes in the names to determine the permutation patterns. (**Floratos**, p457 C1:26-43; Each 'permutation patterns' of applicant is disclosed by the algorithm which produces as output the complete set of all of the maximal (L, W) patterns that appear in at least K of the sequences in the set D of **Floratos**.) and providing said permutation patterns for utilization in said application that process said relationship between said groups of said characters identified by said permutation patterns. (**Floratos**, abstract; 'Utilization' of applicant is illustrated by the 'discovery [of] weak but biologically important similarities' of **Floratos**.)

Claim 29.

Floratos anticipates a computer readable medium (**Floratos**, p471, C1:6-32) containing one or more programs which when executed implement the steps of: selecting a new portion of the input string, the new portion differing from a previously selected portion of the input string by at least one new character of the input string (**Floratos**, p457 C1:26 through C2:4; 'Window size' of applicant is equivalent to 'W' of **Floratos**. When is search mode the method searches at strings of width W. Since a string is being searched this is done by inputting a

new portion of the string on one end of the width and removing an old portion at the other end of the width. Must like a window of size 'W' moving down a one-dimensional array.); determining one or more values for how many of the at least one new character are in the portion of the input string (**Floratos**, p457 C1:26 through C2:4; 'Determining one or more values' of applicant is equivalent to 'L' of Floratos. Where 'L' is the number of matches in a pattern query 'Q'); determining which, if any, names in a plurality of sets of names have changed by selection of the new portion, the plurality of sets comprising a first set and a plurality of additional sets, wherein the first set corresponds to all of the characters in the alphabet and to values of how many of the characters of the alphabet are in the previously selected portion, wherein the values are names for the first set, and wherein each additional set comprises names corresponding to selected pairs of names from a single other set (**Floratos**, p457 C2:5-15; 'First set' of applicant is equivalent to 'query sequence (Q)' of Floratos. 'Additional sets' of applicant is equivalent to matches of 'Q' 'Single other set' of applicant is equivalent to 'D' of Floratos.); and using changes in the names to determine the permutation patterns. (**Floratos**, p457 C1:26-43; Each 'permutation patterns' of applicant is disclosed by the algorithm which produces as output the complete set of all of the maximal (L, W) patterns that appear in at least K of the sequences in the set D of Floratos.) and providing said permutation patterns for utilization in said application that process said relationship between said groups of said characters identified by said permutation patterns. (**Floratos**, abstract; 'Utilization' of

applicant is illustrated by the 'discovery [of] weak but biologically important similarities' of Floratos.)

Claims 30, 32, 34

Floratos anticipates wherein the relationship is structural. (**Floratos**, p456, C2:20-38; 'Structural' of applicant is equivalent to "structural' of Floratos.)

Claims 31, 33, 35

Floratos anticipates wherein the relationship is functional. (**Floratos**, p456, C2:20-38; 'Functional' of applicant is equivalent to 'functional' of Floratos.)

Response to Arguments

8. Applicant's arguments filed on October 3, 2007 for claims 1-35 have been fully considered but are not persuasive.

9. In reference to the Applicant's argument:

Section 101 Rejections

Claims 1-29 are rejected under 35 U.S.C. §101 because the claimed invention is directed to non-statutory subject matter. In particular, the Examiner asserts that the claims fail to provide a tangible result, and notes that there must

be a practical application., The Examiner asserts that 1) the Appellant admits to unknown uses for the invention; 2) relies on "Background" to supply a practical application of the invention; and 3) admits (in paragraph 0019) that the invention is an 'abstract problem.'

Regarding the Examiner's assertion that the Appellant admits to unknown uses for the invention, Applicants note that, as described below, the disclosure clearly 20 identifies practical applications of the invention. The existence of additional unknown uses for the invention has no relevance to the validity of the claims under section 101., In addition, independent claims 1, 20, and 29 have been amended to require providing said permutation patterns for utilization in an application that processes a relationship between groups of said characters identified by said permutation patterns. Applicants believe that this amendment limits the claims to a practical application.

Examiner's response:

The Examiner Objected to the amended specification based on new matter and asked for withdraw of the amendments.

The statement 'The existence of additional unknown uses for the invention has no relevance to the validity of the claims under section 101' made by the appellant is contrary to the MPEP section 2106.

** 35 U.S.C. 101 defines four categories of inventions that Congress deemed to be the appropriate subject matter of a patent*>: < processes, machines, manufactures and compositions of matter. The latter three categories define "things" >or "products"< while the first category defines "actions" (i.e., inventions that consist of a series of steps or acts to be performed). See 35 U.S.C. 100(b) ("The term process' means process, art, or method, and includes a new use of a known process, machine, manufacture, composition of matter, or material.").

Federal courts have held that 35 U.S.C. 101 does have certain limits. First, the phrase "anything under the sun that is made by man" is limited by the text of 35 U.S.C. 101, meaning that one may only patent something that is a machine, manufacture, composition of matter or a process. See, e.g., Alappat, 33 F.3d at 1542, 31 USPQ2d at 1556; Warmerdam, 33 F.3d at 1358, 31 USPQ2d at 1757 (Fed. Cir. 1994). Second, 35 U.S.C. 101 requires that the subject matter sought to be patented be a ">new and< useful" invention. Accordingly, a complete definition of the scope of 35 U.S.C. 101, reflecting

Congressional intent, is that any new and useful process, machine, manufacture or composition of matter under the sun that is made by man is the proper subject matter of a patent.

The subject matter courts have found to be outside of, or exceptions to, the four statutory categories of invention is limited to abstract ideas, laws of nature and natural phenomena. While this is easily stated, determining whether an applicant is seeking to patent an abstract idea, a law of nature or a natural phenomenon has proven to be challenging. These three exclusions recognize that subject matter that is not a practical application or use of an idea, a law of nature or a natural phenomenon is not patentable. See, e.g., *Rubber-Tip Pencil Co. v. Howard*, 87 U.S. (20 Wall.) 498, 507 (1874) ("idea of itself is not patentable, but a new device by which it may be made practically useful is"); *Mackay Radio & Telegraph Co. v. Radio Corp. of America*, 306 U.S. 86, 94, 40 USPQ 199, 202 (1939) ("While a scientific truth, or the mathematical expression of it, is not patentable invention, a novel and useful structure created with the aid of knowledge of scientific truth may be."); *Warmerdam*, 33 F.3d at 1360, 31 USPQ2d at 1759 ("steps of locating' a medial axis, and creating' a bubble hierarchy . . . describe nothing more than the manipulation of basic mathematical constructs, the paradigmatic abstract idea").

****>The courts have also held that a claim may not preempt< ideas, laws of nature or natural phenomena.** The concern over preemption was expressed as early as 1852. See *Le Roy v. Tatham*, 55 U.S. 156, 175 (1852) ("A principle, in the abstract, is a fundamental truth; an original cause; a motive; these cannot be patented, as no one can claim in either of them an exclusive right."); *Funk Brothers Seed Co. v. Kalo Inoculant Co.*, 333 U.S. 127, 132, 76 USPQ 280, 282 (1948) (combination of six species of bacteria held to be nonstatutory subject matter).

Office Action stands.

10. In reference to the Applicant's argument:

Regarding the Examiner's assertion that the Appellant relies on "Background" to supply a practical application of the invention, please note that the specification has also been amended to include the practical application(s), as disclosed in the "Background" section, in the "Detailed Description" section.

Regarding the Examiner's assertion that the appellant admits (in paragraph 0019) that the invention is an 'abstract problem.' Applicant's note that the term 'abstract' was used in a technical sense, and not as a legal admission in the context of the statutory subject matter. In any case, the specification has been amended to change 'abstract problem' to 'problem' in paragraph 0019.

Finally as previously noted, the Supreme Court has stated that the transformation and reduction of an article to a different state or thing is the clue to patentability of a process claim *Gottshalk v Benson*, 409 US 63, 70, 175 U.S.P.Q. (BNA) 676 (1972) In other words, claims that require some kind of transformation of subject matter, which has been held to include intangible subject matter, such as data or signals, that are representative of or constitute physical activity or objects have been held to comply with section 101. See for example *In re Warmerdam* 31 U.S.P.Q.2d (BNA) 1754, 1759 n.5 (Fed Cir. 1994) or *In re Schrader*, 22 F.3d 290, 295, 30 U.S.P.Q.2d (BNA) 1455, 1459 n.12 (Fed Cir. 1994)

Thus as expressly set forth in each of the independent claims, the claimed methods or systems describe discovering permutation patterns from an input string having a plurality of characters, each character being from an alphabet, and transform the input string to permutation patterns. This transformation to permutation patterns provides a useful, concrete and tangible result. For example, the background section of the present disclosure describes how such permutation patterns are utilized in medical applications related to genes and proteins. Thus contrary to the Examiners assertion that no function or application has been stated for the invention, Appellants note that the Background section of the present disclosure describes how such permutation patterns are utilized in medical applications related to genes and proteins (see page 1, line 12 to page 2 line 20). The final result of the cited claims, i.e. permutation patterns are useful, concrete and tangible results.

Appellants submit that each of claims 1-29 as amended are in full compliance with 35 U.S.C. §101 and accordingly respectfully request that the rejection under 35 U.S.C. §101 be withdrawn.

Examiner's response:

In addition to the amended specification being objected to, the amendments themselves fall short in providing a practical application. The amended specification is still within the 'Background' section of the application. This does not act as a rule or guidance for the inventions practical application but

is only 'Background' information. The specification does not disclose a practical application for the invention. Preemption is also illustrated based on 'Utilization in an application' means 'utilization' in any application.' This could be used in the medical field of gene mapping regarding permutation patterns or used in the stock market discovering permutation patterns of stock buying or selling.

Applicant makes the statement that the word 'abstract' was used in a technical sense. The Examiner has no idea what this could mean or has ever seen the word 'abstract' used with a technical description. It is not described within the specification as a technical term with an established definition. The applicant continues with stating that 'abstract' used as a legal admission in the context of statutory subject matter. The Examiner has no idea what this could mean considering the patent application itself is a legal document.

The applicant summarizes by stating the generation of permutation patterns is a practical application. The Examiner disagrees and believes this statement is an abstract concept, which is recited within the specification itself, based on the fact it can be used in numerous applications. Office Action stands.

Examination Considerations

11. The claims and only the claims form the metes and bounds of the invention. "Office personnel are to give the claims their broadest reasonable

interpretation in light of the supporting disclosure. *In re Morris*, 127 F.3d 1048, 1054-55, 44USPQ2d 1023, 1027-28 (Fed. Cir. 1997). Limitations appearing in the specification but not recited in the claim are not read into the claim. *In re Prater*, 415 F.2d, 1393, 1404-05, 162 USPQ 541, 550-551 (CCPA 1969)" (MPEP p 2100-8, c 2, I 45-48; p 2100-9, c 1, I 1-4). The Examiner has the full latitude to interpret each claim in the broadest reasonable sense. Examiner will reference prior art using terminology familiar to one of ordinary skill in the art. Such an approach is broad in concept and can be either explicit or implicit in meaning.

12. Examiner's Notes are provided to assist the applicant to better understand the nature of the prior art, application of such prior art and, as appropriate, to further indicate other prior art that maybe applied in other office actions. Such comments are entirely consistent with the intent and sprit of compact prosecution. However, and unless otherwise stated, the Examiner's Notes are not prior art but link to prior art that one of ordinary skill in the art would find inherently appropriate.

13. Examiner's Opinion: Paragraphs 11 and 12 apply. The Examiner has full latitude to interpret each claim in the broadest reasonable sense.

Conclusion

14. The prior art of record and not relied upon is considered pertinent to the applicant's disclosure.

-U. S. Patent 6486803: Luby

-U. S. Patent 5956724: Griffiths

-U. S. Patent Publication 20010056571: Pennello

-U. S. Patent Publication 20030104394: Dai

15. Claims 1-35 are rejected.

Correspondence Information

16. Any inquiry concerning this information or related to the subject disclosure should be directed to the Examiner Peter Coughlan, whose telephone number is (571) 272-5990. The Examiner can be reached on Monday through Friday from 7:15 a.m. to 3:45 p.m.

If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor David Vincent can be reached at (571) 272-3080. Any response to this office action should be mailed to:

Commissioner of Patents and Trademarks,

Washington, D. C. 20231;

Hand delivered to:

Receptionist,

Customer Service Window,

Randolph Building,

401 Dulany Street,

Alexandria, Virginia 22313,

(located on the first floor of the south side of the Randolph Building);

or faxed to:


(571) 272-3150 (for formal communications intended for entry.)

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have any questions on access to Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll free).



Peter Coughlan

11/28/2007



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